

# LT6911GXD --- Product Brief

## HDMI2.1/DP1.4a/Type-C to Dual-port MIPI/LVDS with Audio

### 1. Features

#### ● HDMI2.1 Receiver

- Compliant with HDMI2.1, HDMI2.0b, HDMI1.4 and DVI1.0
- Data rate up to 10Gbps
- Support HDCP 1.4/2.3
- Support HDCP repeater
- Support RGB 8/10/12 bpc, YCbCr4:4:4/ YCbCr4:2:2/ YCbCr4:2:0 8/10/12 bpc
- Support up to 8K@30Hz RGB/YCbCr4:4:4/ YCbCr4:2:2 10bpc or YCbCr4:2:0 12 bpc
- Support up to 4K@144Hz RGB/YCbCr4:4:4/ YCbCr4:2:2 8bpc or YCbCr4:2:0 12 bpc
- Support up to 8K@60Hz DSC pass-through
- Support HDR10
- Support FEC
- Support CEC
- Support VRR
- Integrated EDID shadow (max 512-byte)
- Support ARC
- Support EARC
- Support lane swap and PN swap

#### ● DP1.4a/eDP1.4b Receiver

- Compliant with DisplayPort specification 1.4a for 1.62Gbps, 2.7Gbps, 5.4Gbps and 8.1Gbps
- Compliant with Embedded DisplayPort specification version 1.4b
- Support SSC
- Support DisplayPort 1/2/4 lanes
- Support FEC
- Support ASSR for eDP
- Support HDCP 1.3/2.3
- Support HDCP repeater
- Support SST/MST mode
- Support RGB 6/8/10/12 bpc, YCbCr4:4:4/YCbCr4:2:2/

YCbCr4:2:0 8/10/12 bpc

- Support up to 8K@30Hz RGB 6bpc, YCbCr4:2:2 10 bpc or YCbCr4:2:0 12 bpc
- Support up to 4K@144Hz RGB 6bpc, YCbCr4:2:2 10 bpc or YCbCr4:2:0 12 bpc
- Support up to 8K@60Hz DSC pass-through
- Support HDR10
- Support Adaptive-Sync
- Support Horizontal Blanking Expansion
- Support lane swap and PN swap

#### ● Type-C

- Compliant with VESA DisplayPort Alt Mode on USB Type-C Standard 1.0b
- DP Alt Mode support pin assignment C, D and E
- Compliant with USB power delivery specification 3.0
- Compliant with USB Type-C cable and connector specification 1.3
- Built-in dual CC logic and PD controller for charger and normal communication
- Data roles supported: UFP
- Power roles supported: source, sink and DRP
- Support USB Billboard

#### ● Dual-Port MIPI® DSI/CSI Transmitter

- Compliant with D-PHY1.2 & DSI 1.3 & CSI-2 1.3; 1 clock lane, and 1/2/3/4 configurable data lanes; 2.5Gbps per data lane
- Compliant with C-PHY1.0 & DSI-2 1.0 & CSI-2 2.0; 1/2/3 configurable data trio; 2.5Gbps per data trio
- Support 1/2 configurable ports
- Support only 1 port for CSI D-PHY 8-lane mode
- Support up to 8K@30Hz YUV422 8bit for CSI D-PHY 8-lane mode
- Support up to 4K@60Hz RGB 10bit
- Support up to 8K@60Hz DSC pass-through
- Support overlap mode

- DSI Support 16/20/24-bit YCbCr4:2:2, 16/18/24/30-bit RGB
  - CSI Support RGB888/666/565, YUV422 8/10bit, YUV420 8bit(legacy)
  - Support side by side 3D
  - D-PHY support port swap, lane swap and PN swap
  - C-PHY support port swap and trio swap
- **Dual-Port LVDS Transmitter**
- Compatible with VESA and JEIDA standard
  - Support 1/2 configurable ports
  - 1 Clock lane and 3/4/5 configurable data lanes per port
  - Data rate up to 1.2Gbps per data lane
  - Support up to 4K@60Hz YCbCr422 8bit
  - Support up to 4K@30Hz RGB 10bit
  - Support side by side 3D
  - Programmable transmitter swing
  - Support SSC
  - Support lane swap and PN swap
- **Digital Audio Input or Output**
- I2S interface supports up to 8-channel audio, with sample rates of 32~192 KHz and sample sizes of 16~24 bits
  - TDM interface supports up to 8-channel audio, with sample rates of 32~192 KHz and sample sizes of 16~24 bits
  - SPDIF interface supports LPCM, Dolby digital, DTS digital audio at up to 192KHz frame rate
  - Compliant with IEC60958 or IEC61937
- **DSC Decoder**
- Compliant with DSC 1.2a
  - Support up to hactive 7680
  - Support up to pixel clock 1.44GHz
  - Support 1/2/4 slices
  - Support color space RGB, YCbCr4:4:4, YCbCr4:2:2, and YCbCr4:2:0
  - Support color depth 8bit and 10bit
  - Support bpp precision 1/16 bit
  - Support dynamic refresh rate
- **DSC Encoder**
- Compliant with DSC 1.2a
  - Support up to hactive 7680
  - Support up to pixel clock 1.44GHz
- Support 1/2/4/8 slices
  - Support color space RGB, YCbCr4:4:4, YCbCr4:2:2, and YCbCr4:2:0
  - Support color depth 8bit and 10bit
  - Support bpp precision 1/16 bit
  - Support dynamic refresh rate
- **Miscellaneous**
- CSC: RGB <-> YCbCr444 <-> YCbCr422<-> YCbCr420
  - Integrated 100/400KHz I2C slave
  - Integrated microprocessor
  - External oscillator 25MHz, +/-50ppm
  - Embedded SPI flash for firmware and HDCP keys
  - Firmware update through I2C or USB interface
  - Power supply: 3.3V and 1.1V

## 2. General Description

LT6911GXD is a high performance HDMI2.1 or DP1.4a to MIPI or LVDS chip for VR/Display application.

HDCP RX as the upstream of HDCP repeater, can cooperate with HDCP TX of other chips to realize the repeater function.

For HDMI2.1 input, LT6911GXD can be configured as 3/4 lanes. Adaptive equalization makes it suitable for long cable application and the maximum bandwidth up to 40Gbps.

The Type-C/DP1.4a input support data rate up to 8.1Gbps which provides sufficient bandwidth for 4K@120Hz, 8K@30Hz or 8K@60Hz with compression data (pass-through).

For MIPI output, LT6911GXD features configurable single-port or dual-port MIPI@DSI/CSI with 1 high-speed clock lane and 1~4 high-speed data lanes operating at maximum 2.5Gbps/lane with D-PHY, which can support a total bandwidth of up to 20Gbps for dual port. Also support 2.5Gbps/trio with C-PHY, which can support a total bandwidth of up to 34.2Gbps for dual port.

For LVDS output, LT6911GXD can be configured as single or dual-port LVDS with 1 high-speed clock lane, and 3~5 high-speed data lanes, operating at maximum 1.2Gbps per lane, which can support a total bandwidth of up to 12 Gbps. LT6911GXD supports flexible video data mapping

path for 2D and 3D applications.

Two digital audio interfaces are available I2S and SPDIF. The I2S interface supports 8-ch LPCM and the SPDIF interface supports 2-ch LPCM or compressed audio, both at maximum 192 KHz sample rate.

The device is capable of automatic operation which is enabled by an integrated microprocessor that uses an embedded SPI flash for firmware storage. System control

is also available through the configuration I2C slave interface.

### 3. Applications

- Mobile system
- Display
- VR
- Video conferencing



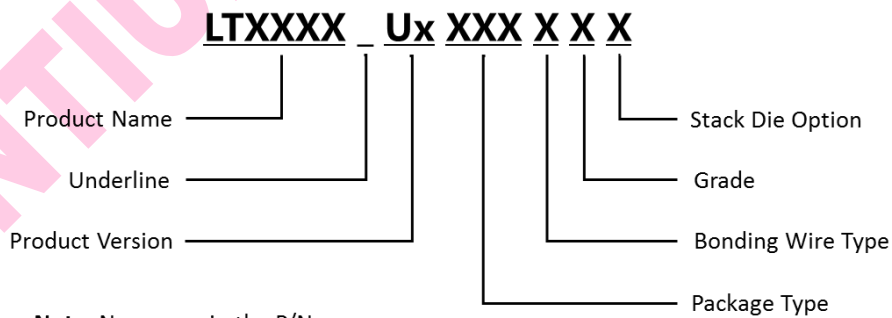
Figure 3.1 Application Diagram

### 4. Ordering Information

Table 4.1 Ordering Information

Product Name	Part Number	Product Status	Package	Bonding Wire	Grade	Operating Temperature Range	Stack Die Option	Packing Method	MPQ
LT6911GXD	LT6911GXD_U2Q02CED	MP	QFN88 (10*10) Saw	Cu	E	-40°C to +85°C	D	Tray	1680pcs
	LT6911GXD_U2Q02AAD	MP	QFN88 (10*10) Saw	Au	A	-40°C to +105°C	D	Tray	1680pcs

Note: LT6911GXD\_U2Q02AAD is an automotive grade device which is qualified by AEC-Q100 Grade 2 testing.



Note: No spaces in the P/N name.

Figure 4.1 Part Number Naming Rules

**Copyright © 2023-2025 Lontium Semiconductor Corporation, All rights reserved.**

### **Lontium Semiconductor Proprietary & Confidential**

This document and the information it contains belong to Lontium Semiconductor. Any review, use, dissemination, distribution or copying of this document or its information outside the scope of a signed agreement with Lontium is strictly prohibited.

LONTIUM DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THOSE OF NONINFRINGEMENT, MERCHANTABILITY, TITLE AND FITNESS FOR A PARTICULAR PURPOSE. CUSTOMERS EXPRESSLY ASSUME THEIR OWN RISK IN RELYING ON THIS DOCUMENT.

LONTIUM PRODUCTS ARE NOT DESIGNED OR INTENDED FOR USE IN LIFE SUPPORT APPLIANCES, DEVICES OR SYSTEMS WHERE A MALFUNCTION OF A LONTIUM DEVICE COULD RESULT IN A PERSONAL INJURY OR LOSS OF LIFE.

Lontium assumes no responsibility for any errors in this document, and makes no commitment to update the information contained herein. Lontium reserves the right to change or discontinue this document and the products it describes at any time, without notice. Other than as set forth in a separate, signed, written agreement, Lontium grants the user of this document no right, title or interest in the document, the information it contains or the intellectual property it embodies.

### **Trademarks**

Lontium™ 龙迅™ and ClearEdge™ is a registered trademark of Lontium Semiconductor. All other brand names, product names, trademarks, and registered trademarks contained herein are the property of their respective owners.

**Visit our corporate web page at: [www.lontiumsemi.com](http://www.lontiumsemi.com)**

**Technical support: [support@lontium.com](mailto:support@lontium.com)**

**Sales: [sales@lontium.com](mailto:sales@lontium.com)**